

## THYSANOPTERA FROM NEW GUINEA, THE PHILIPPINE ISLANDS AND THE MALAY PENINSULA

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This paper is presented as a partial report on the collections of Thysanoptera made by Dr. E. S. Ross in New Guinea and the Philippine Islands during 1944 and 1945 while serving in the Army. Most of the specimens were obtained on or under the bark of decomposing trees in rain forest areas. These collections are rich in material and the writer wishes to express his deep appreciation to Dr. Ross for the opportunity of examining them. There is also included the description of a new species from the Malay Peninsula which has been in the author's collection for some time. Holotypes and allotypes of the new species, except as indicated, are deposited in the California Academy of Sciences. The numbers following records of specimens refer to slide numbers in the Moulton Collection.

## Family PHLAEOTHIRIPIDAE Uzel

## Tribe HOPLOTHRIPINI Priesner

Genus *Agnostothrips* Moulton, new genus

Body moderately stout, prothorax and fore legs heavy. Head approximately 0.33 longer than wide, flattened and not produced in front of eyes; with a distinct emargination between eyes and cheeks; cheeks slightly swollen behind eyes and then gradually reduced to base of head, roughened and bearing several small warts set with short spines; back of head faintly but distinctly reticulate; eyes prominent, semi-protruding, with numerous small facets; ocelli present; with one pair of long postoculars placed well back from eyes and near side margins of head. Antennae approximate at base, 7-segmented, 7 with a partial suture, segment 3 with three long sense cones. Mouth cone broad and strong, extending across prosternum, with pointed tip.

Prothorax heavy, 0.85 as long as head, with incomplete median thickening, sutures complete; all normal setae present, long, with pointed tips; fore legs strong, fore tarsus with a stout tooth; middle and hind femora also reasonably enlarged; wings with parallel sides, double fringes present. Abdomen normal, terga apparently

without sigmoid setae; tube approximately 0.75 as long as head, with parallel sides in basal two-thirds and reduced gradually in apical third; setae on segments 9 and 10 long.

Genotype: *Agnostothrips semiflavus*, n. sp.

This new genus is most closely related to *Symphyothrips* Hood and Williams but in *Symphyothrips* the cheeks are nearly smooth, without warts, the prothorax is relatively shorter, the tube shorter and shaped differently, also the third antennal segment has two sense cones.

#### *Agnostothrips semiflavus* Moulton, new species

Female: Prevailing color brownish yellow, head mostly yellow through the middle, darkened with brown at sides, prothorax more deeply shaded with brown, fore legs brownish yellow, middle and hind femora blackish brown, middle and hind tibiae and tarsi clear yellow; wings clear; antennal segments 1-4 colored like the head, 3 and 4 darkened apically and at sides, 5-7 blackish brown.

With characters as given for the genus; fore wings with 25 double fringe hairs.

Total length 3.8 mm.; head length 0.485 mm., width across cheeks 0.352 mm.; prothorax length 0.411 mm., width 0.602 mm.; pterothorax width 0.573 mm.; tube length 0.352 mm., width at base 0.117 mm. Antennal segments, length (width), III, 156 (66); IV, 146 (56); V, 120 (50); VI, 100; VII, 103 microns, total length 0.808 mm.; length of setae: postoculars 166, on anterior margin of prothorax 100, anterior angles 110, midlateral 156, outer on posterior angles 123, inner 133; on ninth abdominal segment 294, at end of tube 266 microns.

Type material and locality: holotype, female, No. 5879 (Calif. Acad. Sci., Ent.) taken at MAFFIN BAY, DUTCH NEW GUINEA, in June, 1944, by E. S. Ross (5657).

#### *Macrophthalthrips flavafemora* Moulton, new species

Female: Prevailing color brown; ocellar area, median portion of head behind eyes, abdominal segments 8-10 and all coxae black, sides of head and prothorax lighter, abdominal segments 2-7 each with a median dark blotch which extends to sides along anterior margin, otherwise mostly yellow; all femora yellow, middle and hind femora with a faint brownish shading in the middle, fore tibiae yellow, middle and hind tibiae yellow but each with a darkened band in the middle; antennal segments 1-3 yellow, 4-6 gradually shading darker but yellowish in basal portions, 7 and 8 blackish brown; wings nearly clear.

With all of the distinct characters of the genus; fore wings with 10 double fringe hairs.

Total length 2.27 mm.; head length 0.308 mm., width 0.191 mm.; prothorax length 0.191 mm., width 0.264 mm.; pterothorax width 0.338 mm.; tube length 0.147 mm., width at base 0.073 mm. Antennal segments length (width), III, 93 (26); IV, 76 (33); V, 43 (26); VI, 56 (23); VII, 33; VIII, 23 microns, total 0.426 mm.

Type material and locality: holotype, female, No. 5880 (Calif. Acad. Sci., Ent.), and one female paratype, taken on bark of a fallen tree, FINSCHHAFEN, NEW GUINEA, 1944, by E. S. Ross (5652, 5657).

This species is distinctive in having all femora clear yellow. The only other known species with all yellow femora, *williamsi* Hood, from Trinidad, has a narrower darkened band on middle and hind tibiae and the antennae are nearly white with segment 2 at the sides, all of 5 except pedicel and 7 and 8 dark brown.

#### Tribe HAPLOTHRIPINI Priesner

#### *Dolichothrips fuscipes* Moulton, new species

Female: Color blackish brown except apical third of antennal segment 2, all of 3, fore tibiae and tarsi, which are brownish yellow; wings and setae clear.

Head 0.4 longer than wide, with straight cheeks, weakly reduced posteriorly; eyes moderately large, sub-ovate; postoculars long, pointed; antennae 0.6 longer than head, segment 3 with two sense cones; mouth cone reaching across prosternum, pointed; prothorax reasonably small, with an incomplete median thickening, all normal setae present, these long, pointed; wings narrowed in the middle, fore pair with 26-29 double fringe hairs; tube slightly longer than head, with straight sides, reduced gradually to apical end.

Total length 3.4 mm. with abdomen distended; head length 0.367 mm., width 0.259 mm.; prothorax length 0.19 mm., width 0.38 mm.; pterothorax width 0.47 mm.; tube length 0.41 mm., width at base 0.132 mm. Antennal segments length (width): III, 116 (46); IV, 120 (46); V, 110 (36); VI, 80 (33); VII, 66; VIII, 53 microns, total 0.676 mm.; length of setae, postoculars 161, on anterior margin of prothorax 103, anterior angles 83, midlateral 110, outer on posterior angles 156 microns.

Male: Similar in form and color to the female but with larger fore femora and fore tarsus with a short triangular tooth.

Type material and locality: holotype, female, No. 5881 (Calif. Acad. Sci., Ent.), and 14 female paratypes, allotype, and males, No. 5882 (Calif. Acad. Sci., Ent.), and 8 male paratypes, taken

at MAFFIN BAY and FINSCHHAFEN, NEW GUINEA, during April, May, August and September, 1944, by E. S. Ross (5652, 5654, 5659, 5663 and 5666).

This species belongs in that group having dark brown middle and hind legs and is distinctive in its larger size, the greater number of double fringe hairs on fore wings and the relatively long tube.

### Tribe PHLAEOTHRIPINI Priesner

#### PHLAEOTHRIPS CLARATIBIA Moulton

This species was described from a single male specimen taken at Kipapa, Oahu, T. H. (Proc. Haw. Ent. Soc., 9, 3, 414, 1937), and now the female may be described as follows: general color almost identical with the male but somewhat darker; as in the male, the abdomen is nearly clear yellow with only the three terminal segments darkened, also all tibiae and tarsi are clear yellow; fore wings with 10 double fringe hairs. One specimen taken on bark, April 16, 1944, at Finshhafen (5652).

The only other species of *Phlaeothrips* known from New Guinea, *P. spinipes* Bagnall, has a relatively longer head with stronger spines and the fore femora have strong spines on the outside near the base, also antennal segments 3-8 are clear yellow.

#### Genus ECACANTHOTHRIPS Bagnall

This genus is richly represented in these collections from New Guinea and the following species, including two which are new, were found.

#### ECACANTHOTHRIPS BAGNALLI Priesner

Three females and two males taken on bark, April 16, 1944, by E. S. Ross. These appear to be true to species as given in the description by Dr. Priesner (5652). There are two other series taken at Maffin Bay, in September, 1944 (5654), and in August (5659), which should probably be set up as a new variety due to the prevailing brown coloring of middle and hind tibiae, otherwise they are like the species.

#### ECACANTHOTHRIPS SANGUINEUS Bagnall

Found in the 5654 series.

## ECACANTHOTHIRIPS COXALIS Bagnall

Represented by five females and three males in the same series, along with *coxalis* var. *philippinensis* Priesner.

*Ecacanthothrips leai* Moulton, new species

Female: Color brown, with sides of head, second antennal segment and margins of all femora blackish brown, fore tibiae brownish yellow, lighter apically, these darker than middle and hind tibiae which are clear yellow, antennal segments 3-8 grayish brown, bases of 4 and 5 somewhat lighter, fore wings only faintly washed with light brownish gray.

Head short, relatively broad, only 0.2 longer than width across cheeks; cheeks broadened immediately behind eyes, roughened, with two or three minute spines on either side, these placed on barely visible warts; postocular setae long and like other prominent setae with dilated tips; prothorax normal, with all normal setae well developed; pterothorax approximately as wide as width across fore coxae; tube short, rather broad, 0.7 as long as head. Antennal segment 4 longer than segment 3, this with a single row of 12 sense cones; fore femora enlarged, fore tibiae smooth, fore tarsus with a narrow, pointed tooth; fore wings with 10 double fringe hairs.

Total length 1.85 mm.; head length 0.28 mm., width 0.235 mm.; prothorax length 0.16 mm., width 0.352 mm.; pterothorax width 0.382 mm., tube length 0.22 mm., width at base 0.073 mm. Antennal segments, length (width); III, 83 (46); IV, 90 (43); V, 83 (33); VI, (66); VII, 46; VIII, 36 microns. Length of setae, postoculars 113, on anterior margin of prothorax 66, anterior angles 106, mid-laterals 93, outer on posterior angles 100, inner 140 microns.

Type material and locality: holotype, female, taken at KUALA LUMPUR, MALAY PENINSULA, by A. M. Lea (No. 3421). Deposited in Moulton Collection.

This species resembles *E. crassiceps* Karny in general form but the fore femora are unarmed; it differs from *E. guineaensis*, new species, in its shorter and broader head, the fourth antennal segment longer than the third and in the darker colored antennae.

*Ecacanthothrips guineaensis* Moulton, new species

Female: Color blackish brown including antennal segments 1 and 2, and all femora except apical ends which are cleared to yellow; tibiae and tarsi clear yellow; antennal segments 3-5 brownish yellow, cleared to yellow at bases, 6-8 brown with 6 lighter at base; fore wings nearly clear, only faintly washed with light grayish brown.

Head 0.33 longer than width across cheeks, constricted neck-like at base, cheeks roughened, with two or three small cheek spines placed on inconspicuous warts; eyes large, with a distinct emargination at juncture with cheeks, these abruptly wider than width across eyes; postoculars prominent and like other body setae, with dilated tips; prothorax normal for the genus, with all regular setae; abdomen normal, terga 2-7 each with two pairs of sigmoid setae; tube short, approximately 0.6 as long as head, with straight sides. Antennal segment 3 with a single row of ten sense cones; fore femora enlarged, unarmed, fore tibiae unarmed and with almost smooth inner surface, fore tarsus with a short triangular tooth; fore wings moderately slender, with 12-16 double fringe hairs.

Total length 2.45 mm.; head length 0.294 mm., width across cheeks 0.22 mm.; prothorax length 0.147 mm., width 0.323 mm.; pterothorax width 0.367 mm.; tube length 0.176 mm., width at base 0.073 mm. Antennal segments, length (width): III, 106 (50); IV, 100 (43); V, 93 (33); VI, 90 (30); VII, 80; VIII, 40 microns; setae: postoculars 93; on anterior margin of prothorax 53, anterior angles 80, midlateral 50, inner on posterior angles 100, outer 60 microns.

Type material and locality: holotype, female, No. 5883 (Calif. Acad. Sci., Ent.), and two paratype females, taken on bark, April 16, 1944, by E. S. Ross at FINSCHHAFEN, NEW GUINEA (No. 5652).

This species is distinctive with its unarmed fore femora, smooth fore tibiae and almost obsolete cheek warts, these being small and inconspicuous. *E. inernis* Buffa, also from New Guinea, has antennal segments 3-8 clear yellow; *E. inarmatus* Kurosawa has brown middle and hind legs; *E. bagnalli* Priesner has the fourth antennal segment longer than the third.

#### Subfamily MEGATHRIPINAE Priesner

#### Tribe MEGATHRIPINI Priesner

#### *Bactrothrips* (*Bactridothrips*) *guineaensis* Moulton, new species

Male: Color dark brown, abdomen mostly black; antennal segments 1 and 2 blackish brown, 3 and 4 grayish yellow with apical half of enlarged portion brown, 5 light brown with swollen end dark brown (other segments broken off) all femora blackish brown, somewhat lighter at bases, fore tibiae mostly yellow, shaded at sides, middle and hind tibiae like femora but yellowish in apical third, all tarsi yellow; wings washed with brown, darker along margins, cleared in apical fourth, median lines dark brown.

Head produced in front of eyes and including this process, 2.67 times as long as width at base; eyes prominent, with a slight emar-

gination at union with cheeks, these narrowed in median portion of head and widened again before joining with collar at base; anterior ocellus placed much farther in front of posterior ocelli than these are separated from each other; a pair of antecellar setae, 160 microns in length, placed on a line midway between the anterior and posterior ocelli; postocellar setae (60 microns), placed midway between posterior ocelli and a line connecting posterior margins of eyes; first pair of postoculars small (40 microns), placed 23 microns behind eyes and 96 microns apart, second pair long (133 microns), placed 76 microns behind fore pair and 93 microns apart; a pair of cheek spines immediately behind eyes, these short, with blunt tips and two or three weak spines on either side near base of head. Antenna normal for the genus, fore wings with 48 double fringe hairs. Abdominal segment 6 with a pair of horn-like appendages, 0.514 microns in length, those on segments 7 and 8 about 88 microns in length. Tube long and slender, approximately eight times longer than width at base, clothed with numerous hairs standing up at about 45°.

Total length 6.75 mm.; head length 0.69 mm., width across eyes 0.28 mm., across lower cheeks 0.264 mm.; prothorax length 0.235 mm., width 0.47 mm.; pterothorax width 0.78 mm.; tube length 1.17 mm., width at base 0.16 mm.; antennal segments, length (width): III, 470 (50); IV, 367 (50); V, 338 (43); other segments missing.

Type material and locality: holotype, male, No. 5884 (Calif. Acad. Sci. Ent.), taken May 7, at FINSCHHAFEN, NEW GUINEA (5667).

This species is close to *B. furcatus* Priesner from the Belgian Congo, but this species is larger and the wings are clearer with a dark median line which diffuses at its end into a brown colored area while in the new species the fore wings are strongly colored brown with lighter colored areas between the sides and the median streak.

#### Tribe COMPSOTHRIPINI Priesner

#### RHAEBOTHRIPS LATIVENTRIS Karny

One male specimen taken in May, 1944, at Finschhafen, (5666).

#### MACROTHRIPS PAPUENSIS Bagnall

Mr. R. S. Bagnall described three species in this genus, *papuensis*, *intermedia* and *dubius*, all from New Guinea, (Ann. Mag. Nat. Hist., 8, 1, 359-361, 1908; Trans. Nat. Hist. Soc. Northumberland, 3, 1, 187-189, 1908). The material available to Mr. Bagnall con-

sisted of only a few specimens. The present collections made by Mr. Ross in New Guinea include numerous specimens of all the species erected by Mr. Bagnall and all of the specimens which correspond to his *papuensis* are males while all of those which correspond to *intermedia* and *dubius* are females and we have concluded that *intermedia* is the female of *papuensis*. These specimens which could be referred to Mr. Bagnall's *dubius* seem to be smaller and weaker forms of *intermedia*. Characters which were used to differentiate between the two species, the fore coxal projection, the inner tooth of the fore femora, position of the posterior ocelli as well as the teeth on the fore tibia show a blending variation between the stronger and larger *intermedia* and the smaller *dubius* but further material should be studied before including *dubius* also as one of the female forms of *papuensis* (5651, 5652, 5653, 5654).

#### MACHATOTHRIPS BIUNCINATUS Bagnall

Four females and 2 males taken April 16, 1944, at Finschhafen (5652).

#### MACHATOTHRIPS ARTOCARPI Moulton

This species was collected in great numbers, both male and female, at Maffin Bay, in August and September, 1944 (5654, 5659, 5652, 5653).

#### *Machatothrips quadrudentatus* Moulton, new species

Female: Color blackish brown, apical half of antennal segment 2, all of 3, also all tarsi brownish yellow; wings nearly clear at base and tip, brown through the middle and with a heavy brown line from near base to middle; prominent spines on head blackish brown, postoculars and setae on sides and end of abdomen clear yellow.

Head a little less than 0.5 times longer than wide, weakly narrowed behind eyes and at base; antecellar setae prominent, approximately half as long as postoculars, the second pair of postoculars reduced to minor setae; with three or four strong genal spines on either side. Prothorax normal, with an incomplete median thickening, all normal setae present. Abdominal terga 2-7 each with a pair of sigmoid setae near posterior margin; tube with straight sides, narrowed from base to tip, approximately 0.1 times longer than head. Antennae normal for the genus, segment 3 less than three times as long as its greatest width and shorter than segment 4,



3 with two and 4 with four sense cones; segment 8 constricted at base and shorter than 7; legs with thickened fore femora, these with four teeth on the inside, the first largest, placed just beyond the middle, the other three reduced gradually; fore tarsus with a stout triangular tooth; fore wings with 52 double fringe hairs.

Total length 3.85 mm.; head length 0.411 mm., width 0.279 mm.; prothorax length 0.205 mm., width 0.470 mm.; pterothorax width 0.617 mm.; tube length 0.441 mm., width at base 0.147 mm. Antennal segments, length (width : III, 143 (50); IV, 160 (50); V, 143 (46); VI, 93 (33); VII, 60 (30); VIII, 56 microns, total 0.779 mm.

Type material and locality: holotype male, No. 5885 (Calif. Acad. Sci., Ent.), taken in May, 1944, FINSCHHAFEN, NEW GUINEA (5666).

This species is most closely related to *M. brevis* Bagnall which however has a much shorter head, this being only slightly longer than wide and with straight cheeks, antennal segments 7 and 8 are closely joined and the fore wings have 30 double fringe hairs. In this new species the head is relatively longer, antennal segment 8 is constricted at the base and fore wings have 52 double fringe hairs.

#### DINOTHRIPS SUMATRENSIS Bagnall

This species is richly represented in these collections and is apparently one of the most common thrips in New Guinea. The specimens show many variations in size and the number of double fringe hairs on fore wings, some are much larger than those in my collection from India and the Malay Peninsula but there seems to be no single character that could be used to separate them even as a variety of the species (5651, 5652, 5654).

#### DINOTHRIPS MONODON Karny

Six males and one female, taken on bark of a fallen tree at San Jose, Mindoro, in the Philippine Islands (5655).

#### DINOTHRIPS JACOBSONI Karny

Nine males taken along with *D. monodon* Karny on bark of a fallen tree at San Jose, Mindoro, Philippine Islands (5655).

#### MECYNOTHRIPS WALLACEI Bagnall

One female taken on bark of a fallen tree April 12, 1944, at Finschhafen (5651).